

What is claimed is:

1. A plasma processing apparatus comprising:

5 a processing vessel in which a plasma therein is excited to perform microprocessing on a surface of an object to be processed; and

in-chamber components disposed inside the processing vessel,

10 wherein at least one of surfaces of the processing vessel's inner wall and the in-chamber components is coated with an  $Y_2O_3$  sprayed coating over a predetermined area.

2. The plasma processing apparatus of claim 1, wherein the predetermined area is greater than or equal to a surface area [ $S(m^2)$ ] satisfying the following equation,

$$S = 6.554A / (t \times 5 \times 10^6)$$

15 wherein A is a gas flow rate (sccm) in the processing vessel and t is a thickness (m) of the  $Y_2O_3$  sprayed coating.

20 3. The plasma processing apparatus of claim 2, wherein the predetermined area is greater than or equal to  $0.65 m^2$ .

4. The plasma processing apparatus of claim 3, wherein the predetermined area is greater than or equal to  $0.91 m^2$ .

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5. The plasma processing apparatus of claim 1, wherein the in-chamber components include at least one of an upper and a lower electrode.

5 6. The plasma processing apparatus of claim 1, wherein the plasma processing apparatus is used for a contact process.

10 7. The plasma processing apparatus of claim 6, wherein the plasma processing apparatus is used for a self-alignment contact process.